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 MOTHS OF THE GENERA *MULONA* WALKER AND *LOMUNA*,
 A NEW AND CLOSELY RELATED GENUS (ARCTIIDAE:
 LITHOSIINAE)

 By WILLIAM D. FIELD

THE TWO genera of moths¹ treated in this paper are found only in the Greater Antilles and the Bahama Islands. Until the present time they have been treated as a single genus with three species, *Mulona lapidaria* Walker, *Mulona nigripuncta* Hampson, and *Mulona grisea* Hampson.¹ A careful study of the 47 known specimens from the collections of the United States National Museum, the British Museum (Natural History), the American Museum of Natural History, the Carnegie Museum, and Cornell University, disclosed two genera and six species involved in the complex.

Palpal, antennal, and venational characters are identical in the two genera treated in this paper and are given here to avoid repetition in the generic descriptions. Labial palpus upturned, reaching middle or slightly above middle of frons. Antenna of male and female filiform and gradually more slender to the tip; each subsegment with two pairs of bristles, one from near or above middle of ventrolateral margin of subsegment, the second much smaller and just behind the first; subsegments pubescent. Venation of forewing with vein 2 from middle of cell or from just before or after middle, downward curved at base; vein 3 from just below lower angle of cell; veins 4 and 5 separate, 4 from lower angle, 5 from slightly above lower angle (in one of the 5 specimens of *Lomuna nigripuncta* Hampson, 4 and 5 are connate or extremely short stalked); vein 6 from below upper angle of cell; vein 9 from stalk of 7 and 8 or rarely 7 from stalk of 8 and 9;

¹ The species *Autoceras phelina* Druce was placed in *Mulona* by Hampson (Catalogue of the Lepidoptera Phalaenae in the British Museum, vol. 2, p. 387, 1900). It does not belong in *Mulona* and was transferred to the genus *Gaudeator* Dyar by Forbes (Bull. Mus. Comp. Zool., vol. 85, No. 4, p. 183, 1939).

veins 10 and 11 free; vein 10 from middle or nearer stem 7, 8, and 9 than to 11; vein 11 from beyond middle of cell and curved toward 12, distally coincident with 12. Venation of hindwing with vein 2 from outer third of cell or beyond; vein 3 stalked with 4 from lower angle of cell; vein 5 absent; vein 6 separate from 7 or sometimes connate or stalked with 7 (in the single female specimen of *Mulona manni*), 6 from upper angle, 7 from before upper angle of cell; vein 8 from before middle of cell.

KEY TO THE INCLUDED GENERA, BASED UPON GENITALIA

1. Male with uncus short and broadly bilobed; gnathos absent; anellus bifurcate with arms weakly sclerotized and short, one-eighth or less the length of harpes; female with ductus bursa cylindrical, not at all flattened; posterior genital plates absent.....*Lomuna*, new genus
- Male with uncus long, not bilobed, either slender, curved and hooklike, or broad and hoodlike; gnathos present; anellus bifurcate with arms strongly sclerotized and with arms long, nearly as long or longer than harpes; female with ductus bursa flat, not sclerotized or only partially sclerotized; posterior genital plate present.....*Mulona* Walker

Genus MULONA Walker

Mulona WALKER, List of specimens of lepidopterous insects in the collection of the British Museum, vol. 35, p. 1896, 1866.—HAMPSON, Catalogue of the Lepidoptera Phalaenae in the British Museum, vol. 2, pp. 386-388, 1900.—DRAUDT, in Seitz, Gross-schmetterlinge der Erde, vol. 6, p. 252, 1918.—FORBES, Scientific survey of Porto Rico and the Virgin Islands, vol. 12, pt. 1, p. 33, 1930.—STRAND, in Wagner, Lepidopterorum catalogus, pars 26, p. 732, 1922.

Genotype.—*Mulona lapidaria* Walker. Monobasic.

Labial palpus, antenna, and venation as described on page 221.

Male genitalia (pl. 10, figs. 2-6) with uncus slender, curved and hooklike in some species and broad and hoodlike in others, terminating in a short constricted point in all species, this point usually blunt; gnathos weakly sclerotized and divided, forming two broad short lobes; anellus bifurcate with strongly sclerotized arms and these arms nearly as long or longer than harpes; transtilla present and wholly or partially fused; vinculum triangular to nearly round; aedeagus thick throughout, distally broad and blunt and armed with various broad, sometimes dentate lobes; ductus ejaculatorius entering anterior end of aedeagus; vesica with numerous scobinations; harpe with an apical lobe or arm (the cuiller) and with a clavus and with a third arm from base of costa (except in *M. schausi* where apex of harpe is a broad rounded lobe and clavus is greatly reduced).

Female genitalia (pl. 11, figs. 8-11) with ductus bursa nearly flat and only partially sclerotized, with two separate sclerotized latero-ventral plates near ostium bursae or with ductus bursae flat and almost entirely sclerotized, triangular or subtriangular; bursa copu-

latrix obpyriform or subspherical, longer than broad and heavily and completely serratulate through middle two-thirds or more; seventh sternum not modified, weakly sclerotized; eighth sternum with sclerotized bilobed lip at posterior margin (the posterior genital plate), each lobe with sclerotized arm extending anteriorly to ductus bursa; with bilobed invaginated sac on dorsal surface immediately before ovipositor.

Remarks.—As defined above *Mulona* contains five species and is confined to the Greater Antilles and the Bahama Islands.

KEY TO THE SPECIES OF MULONA

- | | |
|--|------------------------------|
| 1. Males..... | 2 |
| Females..... | 6 |
| 2. Uncus broad and hoodlike (pl. 10, figs. 5, 6)..... | 3 |
| Uncus slender, curved and hooklike (pl. 10, figs. 2, 3, 4)..... | 4 |
| 3. Apex of harpe pointed and sharply bent back; clavus as broad as long; harpe without long sharp arm from base of costa (pl. 10, fig. 5)..... | <i>manni</i> , new species |
| Apex of harpe rounded and recurved but not sharply bent back; clavus longer than broad; harpe with a long sharp arm from base of costa (pl. 10, fig. 6)..... | <i>barnesi</i> , new species |
| 4. Anellus with arms of equal length; harpe with costal arm absent (pl. 10, figs. 3, 4)..... | 5 |
| Anellus with arms subequal in length; harpe with costal arm nearly equal in length and subparallel to apical arm (pl. 10, fig. 2)..... | <i>grisea</i> Hampson |
| 5. Harpe with apical arm present, about four times as long as broad, recurved; arms of anellus divergent at free end (pl. 10, fig. 3)..... | <i>lapidaria</i> Walker |
| Harpe without apical arm, apex broadly rounded; arms of anellus directed toward each other at free end (pl. 10, fig. 4)..... | <i>schausi</i> , new species |
| 6. Ductus bursa partially sclerotized with two separate, sclerotized lateroventral bilobed plates near ostium bursae (pl. 11, figs. 10, 11)..... | 7 |
| Ductus bursa almost entirely sclerotized and without separate sclerotized plates (pl. 11, figs. 8, 9)..... | 8 |
| 7. These plates nearly flat and only slightly upturned anteriorly (pl. 11, fig. 11).
<i>barnesi</i> , new species | |
| These plates distinctly curved and greatly upturned anteriorly (pl. 11, fig. 10)..... | <i>manni</i> , new species |
| 8. Ductus bursae with sclerotized plate nearly triangular (pl. 11, fig. 9).
<i>schausi</i> , new species | |
| Ductus bursae with sclerotized plate bilobed near entrance to bursa copulatrix (pl. 11, fig. 8)..... | <i>grisea</i> Hampson |

1. MULONA GRISEA Hampson

PLATE 10, FIGURES 2, 2A; PLATE 11, FIGURE 8

Mulona grisea HAMPSON, Catalogue of the Lepidoptera Phalaenae in the British Museum, vol. 2, p. 388, pl. 29, fig. 30, 1900.—DRAUDT, in Seitz, Grossschmetterlinge der Erde, vol. 6, p. 252, pl. 32, fig. L 8, 1918.—STRAND, in Wagner, Lepidopterorum catalogus, pars 26, p. 732, 1922.

Male.—Palpus light gray or white below, dark fuscous above. Antenna and head white or light gray tinged with yellow or brown, sometimes darker. Mesoscutum, patagium, tegula, and mesoscutellum white or light gray, sprinkled with brownish scales. A light

brown spot at center of hind margin of mesoscutellum. Legs dirty white to pale yellow or brown, fuscous along inner sides of foreleg and with midlegs and hindlegs sometimes faintly banded. Abdomen dirty white. Forewing above gray or grayish white, heavily irrorated with light brown and with the following small dark brown or black spots: one at costa near base of wing; one just below cell and at about the basal one-fourth of cell; a row of four, crossing wing just before middle, the first of these on costal margin, the third just below middle of cell, and the fourth immediately below the third and on the anal vein, the second out of line with the other three and located below front margin of cell near origin of subcosta. There are three of these spots just beyond end of cell, one near lower angle of cell at the base of veins 3, 4, 5, one near upper angle of cell at the base of veins 6 and 7+8+9 and the third just above these on costal margin; three or four submarginal spots cross the wing from costa to hind margin, these usually very indistinct. In the middle of cell near the outer end is a minute orange or orange-yellow spot. Forewing below pale brown, whitish along middle of costa, fringe dirty white above and below. Hindwing above and below pale brown or light fuscous, base much lighter, sometimes dirty white. A large patch of white or grayish white specialized scales along middle of costa covered by forewing.

Length of forewing, 8–9.5 mm.

Male genitalia as illustrated (pl. 10, fig. 2) and with characters as given in the key.

Female.—Habitus entirely like the male.

Length of forewing, 10 mm.

Female genitalia as illustrated (pl. 11, fig. 8) and with characters as given in the key.

Type locality.—Jamaica.

Additional type data.—Described from the holotype (as type), female (Jamaica; J. J. Bowry; ♀ genitalia preparation, British Museum No. 1947–272) and from a male (same locality as female) not designated type in original description.

Location of type.—In the British Museum (Natural History.)

Distribution.—JAMAICA: *St. Andrew Parish*, Kingston, Mount Mansfield House, Gordon Town (July); *Clarendon Parish*, Milk River (August); *Manchester Parish*, Mandeville (June, July, November), Newport (February); *St. Elizabeth Parish*, Balaclava (June). Locality in Jamaica for which the parish is uncertain: May Hill (July).

Twenty-six specimens examined.

Remarks.—The genitalia of the type of *M. grisea* was compared with the figure of the female of this species (pl. 11, fig. 8) by D. S. Fletcher, of the Department of Entomology, British Museum (Natural History). He found the type of *grisea* to be the species I have illustrated.

2. *MULONA SCHAUSI*, new species

PLATE 10, FIGURES 4, 4A; PLATE 11, FIGURE 9

Male.—Habitus very much like that of *Mulona grisea* Hampson. All dark spots on forewing above slightly more indistinct, orange spot as in *grisea*. Hindwing above paler, nearly white, slightly darker along outer angle and with a large dark brown patch of specialized scales along middle of costal margin, extending to below front margin of cell, this area covered by the forewing. Abdomen white above, darker, more brownish below.

Length of forewing, 10–11 mm.

Male genitalia as illustrated (pl. 10, fig. 4) and with characters as given in the key.

Female.—Habitus similar to that of male, forewing above suffused with a dirty yellowish color, particularly along outer margin. Hindwing above and below entirely light fuscous with white fringes.

Length of forewing 10 mm.

Female genitalia as illustrated (pl. 11, fig. 9) and with characters as given in the key.

Type locality.—Matanzas, Province of Matanzas, Cuba.

Additional type data.—Described from the holotype, male (locality as listed above, type U. S. N. M. No. 34830; collection William Schaus; ♂ genitalia slide W. D. F. No. 1655, 1941); allotype, female (Santiago de las Vegas, Province of Habana, Cuba; January 24, 1933; A. Otero; ♀ genitalia slide W. D. F. No. 1661, 1941) and one paratype, male (Province of Habana, Cuba; Father Roberto; ♂ genitalia preparation, British Museum No. 88–1949).

Location of types.—Holotype and allotype in the United States National Museum. Paratype in the British Museum of Natural History.

Distribution.—CUBA: *Province of Habana*, Habana, Santiago de las Vegas (January); *Province of Matanzas*, Matanzas.

Three specimens (all known) examined.

Remarks.—Species named for the late William Schaus.

3. *MULONA MANNI*, new species

PLATE 10, FIGURES 5, 5A; PLATE 11, FIGURE 10

Male.—Very similar to *Mulona grisea* but smaller, usually with a dark spot along middle of outer margin of patagium. Forewing above with a marginal row of small dark spots not found in *M. grisea* or *M. schausi*, orange spot absent. Hindwing above and below somewhat paler than in *grisea* and about as in *schausi*. Specialized scales near base at costa and pale in color. Abdomen white to pale brown.

Length of forewing, 6.5–8 mm.

Male genitalia as illustrated (pl. 10, fig. 5) and with characters as given in the key.

Female.—Habitus very much like the male, hindwing above entirely white.

Length of forewing, 7 mm.

Female genitalia as illustrated (pl 11, fig. 10) and with characters as given in the key.

Type locality.—Mangrove Cay, Andros Island, Bahamas.

Additional type data.—Described from the holotype, male (locality as listed above; type U. S. N. M. No. 34831; William M. Mann; ♂ genitalia slide W. D. F. No. 1663, 1941); allotype, female (same locality and data as holotype; ♀ genitalia slide W. D. F. No. 1664, 1941); paratypes Nos. 1–4, males (same locality as holotype; January 11, 1902; J. L. Bonhote), paratype No. 5, male (Bahamas; Carter; Walsingham collection), and paratype No. 6, male (Little Abaco, Bahamas; March 1902; J. L. Bonhote; ♂ genitalia preparation, British Museum No. 274–1947).

Location of types.—Holotype and allotype in the United States National Museum. Paratypes Nos. 1–6 in the British Museum (Natural History).

Distribution.—BAHAMAS: Andros Island, Mangrove Cay (January), Little Abaco (March).

Eight specimens (all known) studied.

Remarks.—Species named for Dr. William M. Mann, who collected the holotype and allotype.

4. *MULONA LAPIDARIA* Walker

PLATE 10, FIGURES 3, 3A

Mulona lapidaria WALKER, List of specimens of lepidopterous insects in the British Museum, vol. 35 (supplement part 5), p. 1,896, 1866.—KIRBY, Synonymic catalogue of Lepidoptera Heterocera, vol. 1, p. 366, 1892.—HAMPSON, Catalogue of the Lepidoptera Phalaenae in the British Museum, vol. 2, p. 287, 1900.—DRAUDT, in Seitz, Gross-schmetterlinge der Erde, vol. 6, p. 252, pl. 34, figure D 9, 1918.—STRAND, in Wagner, Lepidopterorum catalogus, pars 26, p. 732, 1922.

Male.—This species is closely related to *Mulona manni*. Head and thorax white tinged with pale brown. Forewing above white irrorated with brown, with marginal row of small dark spots as in *manni*. The row of four small dark-brown spots crossing wing just before middle are faintly connected, forming a zigzag line. There is a faint black submarginal streak in lower half of wing nearly parallel to outer margin and a similar streak starting at costa from just before middle of wing, bending down from costa and continuing parallel to costa to near apex, where it is bent upward to costa. With a minute pale yellow spot in middle of cell near outer end. Hindwing above white, outer margin and apex tinged with brown.

Length of forewing, 9 mm.

Male genitalia as illustrated (pl. 10, fig. 3) and with characters as given in the key.

Female.—Unknown.

Type locality.—Santo Domingo ("St. Domingo").

Additional type data.—Described from a single male specimen, the holotype (St. Domingo; Tweedie; genitalia preparation, British Museum No. 1947-275).

Location of type.—In the British Museum (Natural History).

Distribution.—SANTO DOMINGO.

Remarks.—D. S. Fletcher, of the Department of Entomology, British Museum (Natural History), was kind enough to dissect this holotype and send me a photograph of the genitalia. A drawing was made from this photograph and this drawing was checked by Mr. Fletcher for accuracy.

5. *MULONA BARNESI*, new species

PLATE 10, FIGURES 6, 6A; PLATE 11, FIGURE 11

Male.—Similar to the other species of *Mulona*. Forewing above white, the small dark spots usually found in species of this genus are greatly reduced and are missing in the lower half of the wing. Small orange spot in middle of cell near outer end as in *M. grisea* and *M. schausi*. Forewing below white suffused with pale brown. Hindwing above and below slightly brownish along outer margin.

Length of forewing, 8.5-10 mm.

Male genitalia as illustrated (pl. 10, fig. 6) and with characters as given in the key.

Female.—Habitus similar to that of male. Dark spots on forewing above more abundant than in male and hindwing above light brown, paler and whitish at base.

Length of forewing, 9 mm.

Female genitalia as illustrated (pl. 11, fig. 11) and with characters as given in the key.

Type locality.—Santiago de Cuba, Province of Oriente, Cuba.

Additional type data.—Described from the holotype, male (locality as given above; type U. S. N. M. No. 34832; William Schaus; ♂ genitalia slide W. D. F. No. 1657, 1941); allotype, female (same locality as holotype; collection Schaus and Barnes; September; ♀ genitalia slide W. D. F. No. 1660, 1941); paratype No. 1, male (same data as holotype, ♂ genitalia slide W. D. F. No. 1656, 1941) and paratype No. 2, male (Holguin, Province of Oriente, Cuba; H. S. Parish; ♂ genitalia preparation, British Museum No. 1949-89).

Location of types.—Holotype, allotype, and paratype No. 1 in the United States National Museum. Paratype No. 2 in the British Museum (Natural History).

Distribution.—CUBA: Province of Oriente, Santiago de Cuba (September), Holguin.

Four specimens (all known) studied.

Remarks.—Species named for the late John T. Barnes, old friend, constant companion, and assistant to the late William Schaus.

LOMUNA, new genus

Genotype.—*Mulona nigripuncta* Hampson.

Labial palpus, antenna, and venation as described in the introduction.

Male genitalia (pl. 10, fig. 1) with uncus very short and broadly bilobed; gnathos absent; anellus with ventrobasal plate broad and rectangular, entirely fused to harpes and bifurcate at posterior end and with arms very weakly sclerotized and very short, one-eighth or less the length of harpes; transtilla present and partially fused across middle; vinculum with saccus expanded, almost as long as broad and rounded below; aedeagus thick throughout, distally broad and bilobed; ductus ejaculatorius entering anterior end of aedeagus; vesica with numerous scobinations; harpe deeply divided apically into three long and slender arms.

Female genitalia (pl. 11, fig. 7) with ductus bursa sclerotized, cylindrical, not at all flattened; bursa copulatrix subspherical, slightly longer than broad and heavily and completely serratulate through middle two-thirds; seventh and eighth sternae not modified and weakly sclerotized (without anterior and posterior genital plates); with bilobed invaginated sac on dorsal surface immediately before ovipositor.

Remarks.—As defined above *Lomuna* contains a single species known only from Puerto Rico (see remarks on type locality under *L. nigripuncta* Hampson).

LOMUNA NIGRIPUNCTA (Hampson)

PLATE 10, FIGURE 1, 1A; PLATE 11, FIGURE 7

Mulona nigripuncta HAMPSON, Catalogue of the Lepidoptera Phalaenae in the British Museum, vol. 2, pp. 387, 388, pl. 29, fig. 6, 1900.—DRAUDT, in Seitz, Gross-schmetterlinge der Erde, vol. 6, p. 252, pl. 29, fig. L 9, 1918.—STRAND, in Wagner, Lepidopterorum catalogus, pars 26, p. 732, 1922.—FORBES, Scientific survey of Porto Rico and the Virgin Islands, vol. 12, pt. 1, p. 33, 1930.—WOLCOTT, Journ. Agr., University of Puerto Rico, vol. 20, No. 1, p. 415, 1936.

Male.—Habitus somewhat like that of *Mulona grisea* Hampson but with black spots on forewing more distinct and more nearly round. Palpi dark fuscous except along ventral surface, where color is white. Head, antenna, and thorax white, sometimes pale yellow or brown on thorax. Forewing above white with black spots arranged as in *grisea* but with an additional black spot in base of wing on the base of anal vein. The orange or yellow spot found in the middle of the cell near

the outer end in *M. grisea*, *M. schausi*, *M. barnesi*, and *M. lapidaria* is present in *M. nigripuncta* and is orange or yellowish orange. Forewing below nearly white along hind and outer margins, pale brown over rest of wing. Hindwing above and below entirely white. Specialized scales found in *grisea* near costal margin of hindwing are absent in *nigripuncta*. Legs as in *grisea*.

Length of forewing, 8–8.5 mm.

Male genitalia as illustrated (pl. 10, fig. 1).

Female.—Habitus similar to that of the male. Forewings above irrorated with black scales. This irroration sometimes heavy and therefore habitus sometimes much darker than male. Forewing below entirely light fuscous, sometimes paler along hind margin. Hindwing above and below pale fuscous, nearly white or pale gray in base of wing.

Length of forewing, 8–9 mm.

Female genitalia as illustrated (pl. 11, fig. 7).

Type locality.—Probably Puerto Rico. NOTE: Hampson cites the type locality as "Colombia" and his type is labeled "*nigripuncta*, Z., Columb., M. Ber." in Zeller's own handwriting. It is a specimen that Zeller intended to describe and the specimen came originally from the Berlin Museum. This species is known only from Puerto Rico and is not known from Colombia. The species of this group and other closely related groups are very limited in their distribution and hence it is extremely doubtful that the type of *nigripuncta* came from Colombia.

Additional type data.—Described from a single specimen, the holotype, female (locality cited as Colombia but probably is Puerto Rico; collection Zeller; Berlin Museum; ♀ genitalia preparation, British Museum No. 1947–273). Hampson also cites Puerto Rico as a habitat for *nigripuncta* but he does not list number of specimens or sexes for this locality. He had evidently seen specimens other than the type from Puerto Rico; however these were not before him at the time he wrote his original description, hence the single specimen mentioned above is indeed the holotype.

Distribution.—PUERTO RICO: *District of Guayama*, Palmas Abajas, near Guayama (June); *District of San Juan*, Manati (June), Bayamon (July); *District of Aguadilla*, Lares (July); *District of Mayagüez*, San German (April).

Five specimens examined.

Remarks.—The genitalia of the type of *nigripuncta* was compared with the figure of the female of this species (pl. 11, fig. 7) by D. S. Fletcher of the Department of Entomology, British Museum (Natural History). He found the type of *nigripuncta* to be the species there illustrated.

PLATES

The drawings for figures 3 and 3A were made by the author from a photograph of the genitalia of the type. These two drawings were corrected and modified by D. S. Fletcher, of the Department of Entomology, British Museum (Natural History), by comparison with the actual type preparation. Arthur D. Cushman, of the U. S. Bureau of Entomology and Plant Quarantine, made the drawing of the bursa copulatrix and ductus bursae in figure 8 (from an imperfect specimen in the Carnegie Museum) and the drawings of the remaining figures. The rest of figure 8 was drawn from the type by Mr. Fletcher. The following figures were based upon the preparations of the holotypes of the respective species: 3, 3A, 4, 4A, 5, 5A, 6 and 6A. Figures 9, 10, and 11 were drawn from the allotypes of the respective species. Figures 1 and 1A were drawn from slide W. D. F. No. 1651, 1941. Figures 2 and 2A were drawn from slide W. D. F. No. 1658, 1941. Figure 7 was drawn from slide W. D. F. No. 1662, 1941. These three slides were all compared with the genitalia preparations of the types in the British Museum (Natural History).

The size of the genitalia on these plates is indicated by the straight lines placed near the figures. These lines indicate 1 mm.